

ployed on my Ross Equatoreal of 4.2 inches aperture and 61 inches focal length.

*Occultation of  $\chi$  Aquarii, November 8, 1875.*

The star disappeared instantaneously at the Moon's dark limb at

$0^h 43^m 5^s.9$  L.S.T. =  $9^h 32^m 27^s.96$  L.M.T.

The reappearance was not observed. Power 77 with a positive (micrometer) eye-piece.

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*Note on a Successful Attempt to support a Mercury Trough by a compact and easily removable Arrangement.*

By Col. J. F. Tennant, R.E., F.R.S.

Where the level error of a Transit Instrument, or the nadir point of a transit circle, is to be found by reflection of its wires from mercury, it becomes necessary to support the mercury trough, so as to ensure freedom from tremors. I have been much troubled with the job of doing this, and having succeeded in securing a practical result, think that the mode in which I have done it will be interesting to members of the Astronomical Society.

My Transit Instrument stands on a single pier on a solid metal round base, supported by three of Colonel Strange's foot screws; there is a diametral ridge about an inch high in the middle, and four inches wide on this joining the two pillars, and above this again come the arms which raise the transit-axis, and, when turned on the centre, enable it to be readily reversed. The object end of the telescope, when the counterpoises necessary to put the two ends of the telescope in equilibrium are attached, comes within an inch of the reversing carriage, and it has not been easy to get a steady support for the mercury owing to the very confined space for it.

Messrs. Cooke and Sons supplied an iron trough which rested on the reversing carriage. This was simply intolerable, and after trying it I had to give it up at once. I have hardly ever seen the wires in it. Captain Campbell first made a wooden bridge over the reversing arrangement, placing the mercury in a hollow and supporting it on blocks of wood; but this was difficult to remove for observing, and, though the wires *were* seen, it was evident to me that an arrangement of this sort would not answer, as vibrations would be too readily propagated. I then made a trough of amalgamated copper (I believe the idea is Prof. Pritchard's), and supported it in an iron tray on a layer

on sand; the tray was carried on wooden blocks, with small pieces of sheet india-rubber to aid in deadening the vibrations by increasing the number of surfaces where there was a change of elasticity. This was used in December last, and I hoped I had conquered the difficulty, but the time was very favourable as there was (owing to the cold) no traffic at night. When the weather became warm it became manifest that I must either give up the observation by reflection, or devise some means of destroying tremor. I never hardly could get a bearable image of the wires till long after midnight, and to set half a dozen observations entailed an hour's watching.

I have now made two blocks, each a couple of inches high, consisting of six sheets of deal and an equal number of printer's blankets glued together, care being taken not to let the glue penetrate the blankets; these form piers carrying a board, supporting a large and flat dish of mercury. The result, as I anticipated, is excellent; unless carriages are passing along roads only 100 yards off, I have usually reflected wires as sharp as those seen directly. I have yet to devise some plan of avoiding glue, which will certainly yield in India, &c.; it was in the hopes of doing this that I have delayed making up the apparatus till the closing of the rainy season made action necessary.

It will be seen that the great advantage of this form of support is its extreme compactness. The use of such a suspension as that for the mercury of the Reflex Zenith Tube at Greenwich was out of the question here, both from want of space and inability to procure india-rubber, and to preserve it when got. Probably the ultimate form for use here will be a box containing coarse millboard and printer's blankets in alternate layers, but the present arrangement is more compact than anything could be made without the use of glue.

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*Note on Prof. Pritchard's Ephemeris of Circumpolar Stars.*

By Colonel Tennant, R.E., F.R.S.

In the January number of the *Monthly Notices* (Vol. XXXV. p. 113) is a paper giving the places of 12 close circumpolar stars for the current year, in the course of which Professor Pritchard expresses a hope that the Director of the *Nautical Almanac* would take into consideration the question of publishing such Ephemerides in future. In this hope I cordially join; but I am doubtful if the stars chosen in this paper would be generally suitable.

If the ends of the great body of amateurs who have not a computing staff, and of moving astronomers, official or private, can be served as well as those of Observatories having powerful